Mathematical Biosciences

an international journal

Volume 68 1984

Elsevier

Mathematical Biosciences

an international journal

Editor **John A. Jacquez**

Editorial Assistant
MRS. MARIANNE JACQUEZ
490 Huntington Drive
Ann Arbor, Michigan 48104

Associate Editors
Richard Bellman
Founding Editor
Department of Electrical Engineering
University of Southern California
Los Angeles, California 90007

Robert M. May
Department of Biology
Princeton University
Princeton, New Jersey 08540

Book Review Editor
Alan S. Perelson
Los Alamos Scientific Lab.
P.O. Box 1663
Los Alamos, New Mexico 87545

Charles J. Mode
Department of Mathematics
and Institute for Population Studies
Drexel University
Philadelphia, Pennsylvania 19104

Editorial Board

Rutherford Aris
Department of Chemical Engineering
and Materials Science
University of Minnesota

George A. Bekey
Biomedical Engineering
University of Southern California

Leslie E. Blumenson
Roswell Park Memorial Institute
Buffalo, New York, 14263

Chin Long Chiang
Department of Biomedical
and Environmental Health Sciences
University of California, Berkeley

Claudio Cobelli
Department of Electrical Engineering
University of Padua
35100 Padua, Italy

Charles Delisi
National Cancer Institute
Bethesda, Maryland 20014

George F. Estabrook
Department of Botany
The University of Michigan

Stephen Grossberg
Department of Mathematics
Boston University 02215

John Z. Hearon
National Institute of Arthritis
Bethesda, Maryland 20014

Herbert W. Hethcote
Department of Mathematics
University of Iowa
Iowa City, Iowa 52242

Birger Jansson
M. D. Anderson Hospital
and Tumor Institute
Houston, Texas 77030

Samuel Karlin
Department of Mathematics
Stanford University

H. G. Othmer
Department of Mathematics
The University of Utah
Salt Lake City, Utah 84112

John Rinzel
National Institute of Arthritis
Bethesda, Maryland 20014

Michael A. Savageau
Department of Microbiology
The University of Michigan

Lawrence Stark
Physiological Optics
University of California, Berkeley

John L. Stephenson
NHLBI, NIH
Bethesda, Maryland 20014

Mathematical Biosciences

an international journal

Volume 68 1984

MICHAEL H. NATHANSON, GERALD M. SAIDEL, AND GORDON D. MCLAREN (Cleveland, OH)
Analysis of Iron Kinetics: Identifiability, Experiment Design, and Deterministic Interpretations of a Stochastic Model 1

P. COLLI FRANZONE, L. GUERRI, AND E. MAGENES (Pavia, Italy)
Oblique Double Layer Potentials for the Direct and Inverse Problems of Electrocardiology 23

JOHN A. JACQUEZ (Ann Arbor, MI)
The Physiological Role of Myoglobin: More than a Problem in Reaction-Diffusion Kinetics 57

J. EISENFELD (Arlington, TX) AND S. M. GRUNDY (Dallas, TX)
Extension of Compartmental Parameters to Blocks of Compartments with Application to Lipoprotein Kinetics 99

RAJASEKHAR RAMAKRISHNAN, EDWARD F. LEONARD, AND RALPH B. DELL (New York, NY)
A Proof of the Occupancy Principle and the Mean-Transit-Time Theorem for Compartmental Models 121

A. J. WARD-SMITH (Uxbridge, England)
Analysis of the Aerodynamic Performance of Birds during Bounding Flight 137

LETTER TO THE EDITOR

JACQUES DELFORGE (Gif-Sur-Yvette, France) 149

BOOK REVIEWS

DOUGLAS LAUFFENBURGER
Bacterial Chemotaxis as a Model Behavioral System (Daniel E. Koshland, Jr.) 151

GEORGE I. BELL
Structural Biomaterials (Julian F. V. Vincent) 155

LEE A. SEGEL
Differential Equations and Mathematical Biology (D. S. Jones and B. D. Sleeman) 157

JACK M. WINTERS, MOON HYON NAM, AND LAWRENCE W. STARK (Berkeley, CA)
Modeling Dynamical Interactions between Fast and Slow Movements: Fast Saccadic Eye Movement Behavior in the Presence of the Slower VOR 159

B. DENNIS (Moscow, ID) AND G. P. PATIL (University Park, PA)
The Gamma Distribution and Weighted Multimodal Gamma Distributions as Models of Population Abundance 187

H. I. FREEDMAN (Edmonton, Canada) AND PAUL WALTMAN (Iowa City, IA and Atlanta, GA)
Persistence in Models of Three Interacting Predator–Prey Populations 213

V. HUTSON (Sheffield, England)
Predator Mediated Coexistence with a Switching Predator 233

WILLIAM KRENZ AND LAWRENCE STARK (Berkeley, CA)
Neuronal Population Model for the Pupil-Size Effect 247

B. RAJA RAO AND PHILIP E. ENTERLINE (Pittsburgh, PA)
The Sufficient-Component Discrete-Cause Model and its Extension to Several Risk Factors 267

RAYMOND MEJIA AND JOHN L. STEPHENSON (Bethesda, MD)
Solution of a Multinephron, Multisolute Model of the Mammalian Kidney by Newton and Continuation Methods 279

ERRATUM 299

BOOK REVIEWS

MICHAEL A. ARBIB
Consciousness: Natural and Artificial (James T. Culbertson) 301

STEPHEN M. OMOHUNDRO
The Lorenz Equations: Bifurcations, Chaos, and Strange Attractors (C. Sparrow) . . . 303

BOOKS RECEIVED 305

ANNOUNCEMENTS 307